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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,101	04/17/2002	Andrew Mills	SGU-0050	7501

7590 02/23/2005

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EXAMINER

STAICOVICI, STEFAN

ART UNIT	PAPER NUMBER
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1732

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/069,101

Applicant(s)

MILLS ET AL.

Examiner

Stefan Staicovici

Art Unit

1732

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 February 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-23 and 32-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-23 and 32-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 8, 2005 has been entered.

Response to Amendment

2. Applicants' amendment filed February 8, 2005 has been entered. Claims 17, 32-38 have been amended. Claims 1-16 and 24-31 have been canceled. New claim 41 has been added. Claims 17-23 and 32-41 are pending in the instant application.

Claim Objections

3. Claim 41 is objected to under 37 CFR 1.75(c), as failing to further limit the subject matter of a previous claim. Specifically, the limitations of claim 41 are present in independent claim 32 from which it depends, hence rendering claim 41 redundant. Applicant is required to cancel the claim(s), or amend the claim(s).

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim 38-40 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In claim 38, the newly added limitation of a fabric insert that "extends across a node thereof" does not appear to have support in the original disclosure. Although the original disclosure appears to support a fabric insert that "extends continuously across a node thereof," the original disclosure does not appear to support the broader limitation of a fabric insert that "extends across a node thereof."

Claims 39-40 are rejected as dependent claims.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB 1 373 344 in view of FR 2 462 266.

GB 1 373 344 teaches the basic claimed process of molding a reinforced nodal structure including, placing a plurality of resin pre-impregnated fibers (constant cross-section) in channels (24) of a nodal mold (21), closing said mold with pressure plates (26) and curing said resin (see page 1, lines 70-89; page 2, lines 8-35; Figures 1-2).

Regarding claims 17-18, although GB 1 373 344 teaches a plurality of resin pre-impregnated fibers having constant cross-section, GB 1 373 344 does not teach a cored reinforcement, specifically a foam core carbon fiber structure. FR 2 462 266 teaches a fiber reinforced material including a foam core and carbon fiber outer envelope (see page 4, line 15 and line 25). Therefore, it would have been obvious for one of ordinary skill in the art to have provided the fiber reinforced material including a foam core and carbon fiber outer envelope as taught by FR 2 462 266 as an alternative to the resin pre-impregnated carbon fibers in the process of GB 1 373 344 because, FR 2 462 266 specifically teaches that a fiber reinforced material including a foam core and carbon fiber outer envelope provides for a structure that has improved strength and flexibility, hence providing for an improved product.

In regard to claim 19, GB 1 373 344 teaches compressing rubber blocks (13, 14) by a top pressure plate (12) such that said resin pre-impregnated carbon fibers are being compressed. It is submitted that an overfill is present in order for compaction of said resin pre-impregnated carbon fibers to occur.

8. Claims 17-18, 32 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huybrechts *et al.* (US Patent No. 6,245,274) in view of FR 2 462 266.

Huybrechts *et al.* ('274) teach the basic claimed process of molding a reinforced nodal structure including, placing a plurality of resin pre-impregnated fibers (constant cross-section) in channels of a compaction tool (rib compaction area), closing said compaction tool with a vacuum bag and curing said resin in an autoclave (see Abstract).

Regarding claims 17-18, 32 and 41, although Huybrechts *et al.* ('274) teach a plurality of resin pre-impregnated fibers having constant cross-section, Huybrechts *et al.* ('274) do not teach a cored reinforcement, specifically a foam core carbon fiber structure. FR 2 462 266 teaches a fiber reinforced material including a foam core and carbon fiber outer envelope (see page 4, line 15 and line 25). Therefore, it would have been obvious for one of ordinary skill in the art to have provided the fiber reinforced material including a foam core and carbon fiber outer envelope as taught by FR 2 462 266 as an alternative to the resin pre-impregnated fibers in the process of Huybrechts *et al.* ('274) because, FR 2 462 266 specifically teaches that a fiber reinforced material including a foam core and carbon fiber outer envelope provides for a structure that has improved strength and flexibility, hence providing for an improved product.

Further regarding claim 32, Huybrechts *et al.* ('274) teach bagging and curing in an autoclave. It is submitted that bagging includes a step of drawing a vacuum onto said bag in order for the pressure in the autoclave to be greater than the pressure inside the bag.

9. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB 1 373 344 in view of FR 2 462 266 and in further view of Koury (US Patent No. 6,073,670).

GB 1 373 344 in view of FR 2 462 266 teaches the basic claimed process as described above.

Regarding claims 20-21, GB 1 373 344 in view of FR 2 462 266 does not teach a feeder head under computer numerical control that severs length of reinforcement material. Koury ('670) teaches a fiber placement head that places fiber material into channels of a nodal mold such that both the fiber head and the mold are movable and under computer numerical control (see col. 3, lines 19-53). Further, Koury ('670) teaches that said fiber placement head includes a cutter means (see col. 4, lines 35-36). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a feeder head under computer numerical control that severs length of reinforcement material as taught by Koury ('670) in the process of GB 1 373 344 in view of FR 2 462 266 because, Koury ('670) specifically teaches that such a feeder head significantly reduces the time and cost for disposing fiber means, hence increased productivity and reduced costs are obtained.

In regard to claim 22, GB 1 373 344 in view of FR 2 462 266 do not teach a tacky reinforcement. Koury ('670) specifically teaches a tacky reinforcement material that is placed into channels of a nodal mold (see col. 4, lines 5-10). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a feeder head under computer numerical control that severs length of tacky reinforcement material as taught by Koury ('670) in the process of GB 1 373 344 in view of FR 2 462 266 because, Koury ('670) specifically teaches that such a feeder head significantly reduces the time and cost for disposing fiber means, hence increased productivity and reduced costs are obtained and also because, Koury ('670) teaches that a tacky fiber material is required to make a reinforced nodal structure, whereas GB 1 373 344 on view of FR 2 462 266 teaches a reinforced nodal structure.

10. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huybrechts *et al.* (US Patent No. 6,245,274) in view of FR 2 462 266 and in further view of Koury (US Patent No. 6,073,670).

Huybrechts *et al.* ('274) in view of FR 2 462 266 teaches the basic claimed process as described above.

Regarding claims 20-21, Huybrechts *et al.* ('274) in view of FR 2 462 266 does not teach a feeder head under computer numerical control that severs length of reinforcement material. Koury ('670) teaches a fiber placement head that places fiber material into channels of a nodal mold such that both the fiber head and the mold are movable and under computer numerical control (see col. 3, lines 19-53). Further, Koury ('670) teaches that said fiber placement head includes a cutter means (see col. 4, lines 35-36). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a feeder head under computer numerical control that severs length of reinforcement material as taught by Koury ('670) in the process of Huybrechts *et al.* ('274) in view of FR 2 462 266 because, Koury ('670) specifically teaches that such a feeder head significantly reduces the time and cost for disposing fiber means, hence increased productivity and reduced costs are obtained.

In regard to claim 22, Huybrechts *et al.* ('274) in view of FR 2 462 266 do not teach a tacky reinforcement. Koury ('670) specifically teaches a tacky reinforcement material that is placed into channels of a nodal mold (see col. 4, lines 5-10). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a feeder head under computer numerical control that severs length of tacky reinforcement material as taught by Koury ('670) in

the process of Huybrechts *et al.* ('274) in view of FR 2 462 266 because, Koury ('670) specifically teaches that such a feeder head significantly reduces the time and cost for disposing fiber means, hence increased productivity and reduced costs are obtained and also because, Koury ('670) teaches that a tacky fiber material is required to make a reinforced nodal structure, whereas GB 1 373 344 on view of FR 2 462 266 teaches a reinforced nodal structure.

11. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over GB 1 373 344 in view of FR 2 462 266 and in further view of Mayes, Jr. *et al.* (US Patent No. 4,137,354).

GB 1 373 344 in view of FR 2 462 266 teaches the basic claimed process as described above.

Regarding claim 23, GB 1 373 344 in view of FR 2 462 266 does not teach introducing an insert in order to provide localized strengthening. Mayes, Jr. *et al.* ('354) teach a carbon fiber reinforced nodal structure having an insert (18) positioned at each node (12) (see col. 3, lines 34-36). Therefore, it would have been obvious for one of ordinary skill to have provided an insert positioned at each node as taught by Mayes, Jr. *et al.* ('354) in the reinforced nodal structure obtained by the process of GB 1 373 344 in view of FR 2 462 266 because, Mayes, Jr. *et al.* ('354) teach that such inserts provides for improved strength because said fibers intersect about said insert (see Figure 2) and also because, both GB 1 373 344 and Mayes, Jr. *et al.* ('354) teach similar end products and materials.

12. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huybrechts *et al.* (US Patent No. 6,245,274) in view of FR 2 462 266 and in further view of Mayes, Jr. *et al.* (US Patent No. 4,137,354).

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Huybrechts *et al.* ('274) in view of FR 2 462 266 teaches the basic claimed process as described above.

Regarding claim 23, Huybrechts *et al.* ('274) in view of FR 2 462 266 does not teach introducing an insert in order to provide localized strengthening. Mayes, Jr. *et al.* ('354) teach a carbon fiber reinforced nodal structure having an insert (18) positioned at each node (12) (see col. 3, lines 34-36). Therefore, it would have been obvious for one of ordinary skill to have provided an insert positioned at each node as taught by Mayes, Jr. *et al.* ('354) in the reinforced nodal structure obtained by the process of Huybrechts *et al.* ('274) in view of FR 2 462 266 because, Mayes, Jr. *et al.* ('354) teach that such inserts provides for improved strength because said fibers intersect about said insert (see Figure 2) and also because, both Huybrechts *et al.* ('274) and Mayes, Jr. *et al.* ('354) teach similar end products and materials.

13. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over GB 1 373 344 in view of FR 2 462 266 and in further view of White *et al.* (US Patent No. 5,427,725).

GB 1 373 344 in view of FR 2 462 266 teaches the basic claimed process as described above.

Regarding claim 22, GB 1 373 344 in view of FR 2 462 266 does not teach tackifying the fiber reinforcement. White *et al.* (725) teach molding a fiber composite including, a first step of partially curing a tackified fiber reinforced composite and a second step of molding said tackified composite (see Abstract). It would have been obvious for one of ordinary skill in the art to have tackified the fiber reinforced preform as taught by White *et al.* ('725) in the process of GB 1 373 344 in view of FR 2 462 266 because, White *et al.* ('725) specifically teach that tackifying

provides for net-shape molding of fiber reinforced composite structures, which in turn reduces production time, hence increasing productivity.

14. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huybrechts *et al.* (US Patent No. 6,245,274) in view of FR 2 462 266 and in further view of White *et al.* (US Patent No. 5,427,725).

Huybrechts *et al.* ('274) in view of FR 2 462 266 teaches the basic claimed process as described above.

Regarding claim 22, Huybrechts *et al.* ('274) in view of FR 2 462 266 does not teach tackifying the fiber reinforcement. White *et al.* (725) teach molding a fiber composite including, a first step of partially curing a tackified fiber reinforced composite and a second step of molding said tackified composite (see Abstract). It would have been obvious for one of ordinary skill in the art to have tackified the fiber reinforced preform as taught by White *et al.* (725) in the process of Huybrechts *et al.* ('274) in view of FR 2 462 266 because, White *et al.* (725) specifically teach that tackifying provides for net-shape molding of fiber reinforced composite structures, which in turn reduces production time, hence increasing productivity.

15. Claims 17-18 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deckers *et al.* (US Patent No. 6,050,315) in view of FR 2 462 266.

Deckers *et al.* ('315) teaches the basic claimed process of molding a reinforced nodal structure including, placing a plurality of resin pre-impregnated fibers (constant cross-section) in channels (22) of a nodal mold, closing said mold with pressure plates (130) and curing said resin (see col. 11, lines 5-10 and 40-65; Figure 17).

Regarding claims 17-18, although Deckers *et al.* ('315) teaches a plurality of resin pre-impregnated carbon fibers having constant cross-section, Deckers *et al.* ('315) does not teach a cored reinforcement, specifically a foam core carbon fiber structure. FR 2 462 266 teaches a fiber reinforced material including a foam core and carbon fiber outer envelope (see page 4, line 15 and line 25). Therefore, it would have been obvious for one of ordinary skill in the art to have provided the fiber reinforced material including a foam core and carbon fiber outer envelope as taught by FR 2 462 266 as an alternative to the resin pre-impregnated carbon fibers in the process of Deckers *et al.* ('315) because, FR 2 462 266 specifically teaches that a fiber reinforced material including a foam core and carbon fiber outer envelope provides for a structure that has improved strength and flexibility, hence providing for an improved product.

In regard to claims 20-21, Deckers *et al.* ('315) teaches a feeder head under computer numerical control that severs length of reinforcement material (see col. 7, line 27 through col. 8, line 18).

Specifically regarding claim 22, Further, Deckers *et al.* ('315) teaches thermal tacking of previously laid reinforcement material (see col. 7, lines 15-26).

16. Claims 33-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huybrechts *et al.* (US Patent No. 6,245,274) in view of FR 2 462 266 and in further view of Slysh (US Patent No. 4,012,549).

Huybrechts *et al.* ('274) in view of FR 2 462 266 teach the basic claimed process as described above.

Regarding claim 33, 35 and 37-38, Huybrechts *et al.* ('274) in view FR 2 462 266 does not teach fabric inserts positioned in the mold channels. Slysh ('549) teaches an isogrid structure including, fabric strip inserts (18) that extend across a node in a discontinuous manner, hence resulting in an improved product (see col. 2, lines 37-45). Therefore it would have been obvious for one of ordinary skill in the art to have provided fabric strip inserts as taught by Slysh ('549) in the mold channels in the process of Huybrechts *et al.* ('274) in view FR 2 462 266 because, Slysh ('549) teaches that such strips increase the strength and quality of an isogrid product, whereas Huybrechts *et al.* ('274) in view FR 2 462 266 teach a process for making an isogrid structure.

In regard to claims 34 and 39, it is submitted that the "insert" in the process of Huybrechts *et al.* ('274) in view FR 2 462 266 and in further view of Slysh ('549) is placed before, during or after positioning the fiber material in the mold because said "insert" becomes an integral part of said resulting molded product by the process of Huybrechts *et al.* ('274) in view FR 2 462 266 and in further view of Slysh ('549) and as such must be placed in the mold prior to curing, hence before, during or after positioning the fiber material in the mold.

Specifically regarding claims 36 and 40, Slysh ('549) teaches an isogrid structure including in which fabric strip inserts (18) are placed in the top and bottom surfaces, hence resulting in an improved product (see col. 2, lines 37-45). Hence, it is submitted that such inserts are to be placed before or after a plurality of fiber layers have been placed in a mold in the process of Huybrechts *et al.* ('274) in view FR 2 462 266 and in further view of Slysh ('549). Therefore it would have been obvious for one of ordinary skill in the art to have provided fabric

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strip inserts as taught by Slysh ('549) in the mold channels in the process of Huybrechts *et al.* ('274) in view FR 2 462 266 because, Slysh ('549) teaches that such strips increase the strength and quality of an isogrid product, whereas Huybrechts *et al.* ('274) in view FR 2 462 266 teach a process for making an isogrid structure.

Response to Arguments

17. Applicants have not submitted any arguments with the amendment filed February 8, 2005. It is submitted that all arguments have been considered and answered in the Final rejection mailed September 8, 2004.

Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stefan Staicovici, Ph.D. whose telephone number is (571) 272-1208. The examiner can normally be reached on Monday-Friday 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael P. Colaianni, can be reached on (571) 272-1196. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Stefan Staicovici, PhD



2/19/05

Primary Examiner

AU 1732

February 19, 2005